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AMENDMENTS TO THE CLAIMS

Claims 26 and 29-31 are amended as follows, and Claim 25 is canceled:

1. (previously canceled)

2. (previously canceled)

3. (previously amended) The method of Claim 31 wherein said substrate is selected from the group consisting of Group IV elements, III-V compound semiconductors, oxides, nitrides, oxynitrides, organic films, organic dielectrics, organo-metallic complexes and polymers, metals, and metal alloys.

4. (original) The method of Claim 3 wherein said Group IV elements are selected from the group consisting of silicon, polysilicon, and germanium, said III-V compound semiconductors consist essentially of gallium arsenide, said oxides are selected from the group consisting of crystalline and glassy oxides, and said organic dielectrics consist essentially of an organic polymer.

5. (previously amended) The method of Claim 4, wherein said organic polymer is selected from the group consisting of polyimides, copolyimides, polyamides, polyamide-imides, fluorinated polyimides, poly(arylenethers), fluorinated poly(arylenethers), perfluorinated alkylene oxides, parylene (N, C, D, or F type), poly(phenylquin-oxalines), poly-naphthalene, poly-fluorinated naphthalene, benzocyclobutene (BCB), amorphous fluoropolymers, such as polytetrafluoroethylene, perfluorocyclobutane aromatic ether (PFCB), polynorbornene, and fluorinated carbon.

6. (previously amended) The method of Claim 31 further including:

in step (a) subjecting said organic coatings, films, layers, or residues to said precursor chemical or precursor physical treatment, including, prior to said subjecting

(a1) placing said substrate in a chamber;

(a2) purging said chamber with a dry inert gas;

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in step (1) introducing said vapor consisting essentially of water-free gaseous sulfur trioxide into said chamber or in a separate chamber to react with said coating, film, layer, or residue, including allowing said period of time to pass to permit reaction between said sulfur trioxide and said coating; and

in step (c) ending said reaction between said sulfur trioxide and said coating by subjecting said substrate or device to an end-point chemical or end-point physical treatment.

7. (previously amended) The method of Claim 6 wherein said dry, inert gas consists essentially of nitrogen or argon.

8. (previously amended) The method of Claim 31 wherein said precursor chemical treatment is selected from the group consisting of exposure to chemically active process gases, chemically inert process gases, and solvents.

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9. (previously amended) The method of Claim 8 wherein said chemically active process gases are selected from the group consisting of oxygen, nitrous oxide, steam, and vapor phase hydrogen peroxide and wherein said chemically inert process gases are selected from the group consisting of nitrogen and argon.

10. (original) The method of Claim 9 wherein said solvents are selected from the group consisting of water, lower alkanols, acetone, acids, bases, choline, amine-based solutions, and mixtures thereof.

11. (previously amended) The method of Claim 31 wherein said precursor physical treatment is selected from the group consisting of exposure to heat, ultra-violet radiation, laser energy, ultrasonic and megasonic sound energy.

12. (previously amended) The method of Claim 31 wherein said precursor chemical or physical treatment is carried out at a temperature between room temperature and 400°C.

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13. (previously amended) The method of Claim 31 wherein said solvent rinse is performed in a solvent selected from the group consisting of water, lower alkanols, acetone, acids, bases, choline, amine-based solutions,, and mixtures thereof.

14. (previously amended) The method of Claim 31 wherein said solvent rinse is simultaneously carried out in the presence of megasonic or ultrasonic energy, heat, ultra-violet radiation, or laser energy.

15. (previously amended) The method of Claim 31 wherein said post-rinse chemical treatment is selected from the group consisting of further exposure to chemically active process gases or vapors, chemically inert process gases, and solvents.

E/ 16. (previously amended) The method of Claim 15 wherein said chemically active process gases are selected from the group consisting of oxygen, nitrous oxide, steam, and vapor phase hydrogen peroxide and wherein said chemically inert process gases are selected from the group consisting of nitrogen and argon.

17. (original) The method of Claim 15 wherein said solvents are selected from the group consisting of water, lower alkanols, acetone, acids, bases, choline, amine-based solutions, and mixtures thereof.

18. (previously amended) The method of Claim 31 wherein said post-rinse physical treatment is selected from the group consisting of further exposure to heat, ultra-violet radiation, laser energy, kinetic energy, high-pressure deionized water sprays, physical scrubbing, CO₂ snow processing, ultrasonic and megasonic sound energy.

19. (previously amended) The method of Claim 31 wherein said post-rinse chemical or physical treatment is carried out at a temperature between room temperature and 400°C.

20. (currently amended) The method of Claim 31 wherein step (b) (c) further comprises subjecting said organic coatings, films, layers, or residues to simultaneous exposure to a component selected from the group consisting of other chemically active process gases and

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vapors, chemically inert process gases, vaporized solvents, heat, ultra-violet radiation, and laser energy.

21. (previously amended) The method of Claim 20 wherein said chemically active process gases are selected from the group consisting of oxygen, nitrous oxide, steam, and vapor phase hydrogen peroxide and wherein said chemically inert process gases are selected from the group consisting of nitrogen and argon.

22. (original) The method of Claim 20 wherein said solvents are selected from the group consisting of water, lower alkanols, acetone, acids, bases, choline, amine-based solutions, and mixtures thereof.

E1 23. (previously amended) The method of Claim 31 wherein each said subjecting step is independently performed for a period of time up to about 5 minutes.

24. (previously canceled)

25. (canceled)

26. (currently amended) The method of Claim ~~25~~ 31 wherein said pre-rinse chemical treatment is selected from the group consisting of further exposure to chemically active process gases or vapors, chemically inert process gases, and solvents.

27. (previously amended) The method of Claim 26 wherein said chemically active process gases are selected from the group consisting of oxygen, nitrous oxide, steam, and vapor phase hydrogen peroxide and wherein said chemically inert process gases are selected from the group consisting of nitrogen and argon.

28. (original) The method of Claim 26 wherein said solvents are selected from the group consisting of water, lower alkanols, acetone, acids, bases, choline, amine-based solutions, and mixtures thereof.

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29. (currently amended) The method of Claim 25 31 wherein said pre-rinse physical treatment consists of further exposure to a component selected from the group consisting of heat, ultra-violet radiation, laser energy, kinetic energy, high-pressure deionized water sprays, physical scrubbing, CO₂ snow processing, ultrasonic and megasonic sound energy.

30. (currently amended) The method of Claim 25 31 wherein said pre-rinse chemical or physical treatment is carried out at a temperature between room temperature and 400°C.

31. (currently amended) An improved method for partially or completely removing organic coatings, films, layers or residues from a substrate, said method comprising:

(1) subjecting said organic coatings, films, layers, or residues to a vapor consisting essentially of water-free gaseous sulfur trioxide for a period of time, said substrates being maintained at a temperature in the range from about room temperature to 400°C; and

(2) subjecting said organic coatings, films, layers, or residues to a solvent rinse;

wherein the improvement comprises the following steps:

(a) providing organic coatings, films, layers and residues that are selected from the group consisting of polymerized photoresists, paints, resins, single and multilayer organic polymers, organo-metallic complexes, positive optical photoresist, negative optical photoresist, electron-beam photoresists, X-ray photoresists, ion-beam photoresists, ion-implanted photoresists, and other hardened photoresists, wherein said organic polymers are selected from the group consisting of polyimides, copolyimides, polyamides, polyamide-imides, fluorinated polyimides, poly(arylenethers), fluorinated poly(arylenethers), perfluorinated alkylene oxides, parylene (N, C, D, or F type), poly(phenylquin-oxalines), poly-naphthalene, poly-fluorinated naphthalene, benzocyclobutene (BCB), amorphous fluoropolymers, such as polytetrafluoroethylene, perfluorocyclobutane aromatic ether (PFCB), polynorbornene, and fluorinated carbon, and wherein said substrate consists of at least one portion of a device selected from the group consisting of semiconductor devices and wafers, liquid crystal display devices, flat-panel displays, printed circuit boards, magnetic read/write heads, thin-film read/write heads;

(b) subjecting said organic coatings, films, layers, or residues of step (a) to a ~~precursor~~ pre-rinse chemical or physical treatment prior to step (1) capable of facilitating the

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reaction of said sulfur trioxide with the organic coatings, films, layers or residues to be removed;

(c) carrying out said step (1) so that said water-free, gaseous sulfur trioxide reacts with said organic coatings, films, layers, and residues to form ~~physically or chemically~~ altered reacted and unreacted organic material;

(d) carrying out said step (2) to remove said ~~altered~~ reacted and unreacted organic material from said substrates; and

E1 (e) subjecting said organic coatings, films, layers, or residues to a chemical or physical post-rinse treatment subsequent to step (2) capable of removing any residual organic material from said substrates remaining after said solvent rinse.
